EMULEX CORPORATION

Performance Series Servers October 7, 1994

Release Notes For Version 2.4

The Performance Series 2.4 release notes provides information relative to this version which are not documented elsewhere. This includes *new features, management hints, bug fixes and known problems*. To quickly locate items of interest see the Table of Contents starting on page iii.

In order to receive all updates you should subscribe to the Software Update Program (SUP) for your particular Performance Series model (contact your distributor or Emulex Corporation for more information).

SPECIAL NOTE: This software release allows you to enter a Product Authorization Key (PAK) in order to select protocols and features needed for a particular server. The advantage is to custom tailor servers to meet your precise networking needs.

If the Login Banner is enabled for the server ports, any user logging on to the server will encounter the Software license banner. The banner will also display an Unrestricted Trial Period for your server. **The unrestricted trial period allows you to evaluate all server features unconditionally during this time and especially pertains to features not enabled by your particular PAK.** After the trial period expires only the features enabled by your PAK will be usable and the message will no longer be displayed. Ignore the messages if a PAK is installed, or the server ethernet address is less than 00-00-C9-01-50-00. Servers prior to Ethernet address 00-00-C9-01-50-00 will require a PAK to use certain new features made available in upcoming releases.

You may also enter the privileged command SHOW SERVER KEY to show the server's current PAK, and its status. For all servers, a warning message will be displayed showing **the trial period (unconditional evaluation)** for features which have not been enabled by your PAK. If upon reviewing the display, all features you desire are enabled, then you may ignore this warning message. Only those features which are not enabled on the server by your PAK, will become unavailable after the grace period expires.

Contact the address in chapter 2 for PAKs, changes to PAKs, or questions regarding PAKs.

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1. PERFORMANCE SERIES PRODUCT OVERVIEWS:

The Performance Series Servers facilitate connections to virtually any network device supporting either TCP/IP or LAT protocols. Two user interfaces are provided for commands, displays, and command recall/line editing functions - A Unix-like command set and an equivalent DECserver 200 command set.

The Performance Series Servers support an extensive Power On Self Test (POST) and boot-time network loading of their associated operational software. These features are contained in firmware referred to as the PerformancePAK. The PerformancePAK firmware can be located in one of two places:

- A set of PROMS on the main server board.
- A physical module which slides into the server.

The Emulex family of terminal servers - Performance 2500, Performance 4000, Performance 6000, Performance 8000 - and their characteristic PerformancePAKs are described in the next few sections.

1.1 Performance 2500:

The Performance 2500 hardware is available in the following configurations:

- **Performance 2500 with 16 ports.** This unit contains 16 partial modem (RJ12 only) ports and is referred to as a Model P2516.

- **Performance 2500 with 8 ports.** This unit contains 2 full modem and 6 partial modem (RJ12 or MMJ) ports and is referred to as a Model P2508.

- **Performance 2500 with 5 ports.** This unit contains 4 full modem and a single parallel printer port and is referred to as a Model P2504.

The PerformancePAK firmware allows the Performance 2500 to load its operational software from firmware installed within the server as well as being able to perform a Network Load.

1.2 Performance 4000:

The Performance 4000 hardware consists of the following configurations:

- **Performance 4000 Base Unit**. The base unit contains either 12 or 16 serial ports and one parallel port. The first four ports of the 16 port configuration may be partial (RJ12 or MMJ) or full (DB25) modem control. The RAM PerformancePak described later, is necessary to provide the one megabyte of RAM required to support the Performance Series software.

- **Performance 4000E Base Unit**. The base unit contains either 12 or 16 serial ports and one parallel printer port. The first four ports of the 16 port configuration may be partial (RJ12 or MMJ) or full (DB25) modem control.

- **Performance 4000B Base Unit**. The base unit contains 16 or 32 (RJ12 or MMJ) serial ports and one parallel printer port. If modem control is required then the first four ports of the 16 port base unit configuration are full (DB25) modem control.

- **Expansion Unit**. The expansion unit can add 16 ports to the base unit with the first four ports being either full (DB25) or partial (RJ12 or MMJ) modem control. Each base unit can accommodate one expansion unit. An expansion unit cannot be used with a 32 port Performance 4000B base unit.

The Performance 4000 and Performance 4000E model base units provide a small printed circuit board for the PerformancePak, which plugs in through the front bezel. The Performance 4000B has the PerformancePak circuitry on its main board. The available PerformancePak options are:

- **Network Load**. This allows the Performance 4000 to load its operational software from any DECnet-compatible host, or TFTP host. This is allowed only in Performance 4000E base unit.

- **Network Load Plus RAM**. This PerformancePak offers 512k bytes of expansion RAM in addition to network load capabilities and is used to increase a 512k bytes version of the Performance 4000 to the one megabyte capacity which is required for the Performance 4000 product.

- **Performance 4000B Network Load**. This PerformancePak is used exclusively in a Performance 4000B server. It does not contain any circuitry other than the LEDs for the front panel.

- **Performance 4000B Self Load.** This PerformancePak is used exclusively in a Performance 4000B server. It enables the server to load its operational software from firmware installed within the server as well as being able to perform a Network Load. The minimum version of Loader Firmware to support self load software versions 2.15 and greater, is 1.82.

Self Load is not available for the Performance 4000 and Performance 4000E base unit versions of server.

NOTE: Do not attempt to install the Network Load PerformancePAK or Network Load Plus RAM PerformancePAK into a Performance 4000B.

1.3 Performance 6000:

The Performance 6000 hardware consists of the following:

- **Rack Mount or Table Top Chassis with LCD.** This chassis houses all of the modules which are supported in the Performance 6000 subsystem, including the backplane, dual fans and modular adapter board slots. The built-in LCD display and front panel buttons allow the user to view/select information for the server.

- **Device Adapter Modules(s).** The Performance 6000 subsystem supports up to 88 ports, in combinations of the following adapter modules:

  Partial Modem Adapter Module - This module supports 8 serial RJ12 or MMJ partial modem ports which support RS423 signal levels.

  Full Modem Adapter Module - This module supports 8 serial Full modem ports via two DB44 connectors. A DB44 to Telco cable can then be used to connect to a Fan-out cable, Punch-down block, or other cabling solution as required. This module supports RS232 signal levels for the modem signals.

  2-Port Parallel Adapter Module - This module supports 2 parallel printer ports which can each be configured for Centronics or Dataproducts interfaces.

  These Adapter Modules can be installed in any combination of types allowing for a high degree of flexibility (with the only limitation being, Parallel Adapter Modules MUST be installed FOLLOWING the serial adapter modules to work correctly).

- **Ethernet Adapter Modules.** The Performance 6000 subsystem consists of one of two types of Ethernet adapter modules.

  Thinwire & 15 pin AUI - This adapter supports either a Thinwire or Thickwire Ethernet connection for the server.

  Twisted Pair & 15 pin AUI - This adapter supports either a Twisted Pair or Thickwire Ethernet connection for the server.

  Only one of the two types of Ethernet Adapter modules is supported in a Performance 6000 at a time. For the module installed, only a single Thinwire, Twisted Pair or 15 pin AUI is required. Each module automatically detects the type of Ethernet cable installed.

- **Self Load Adapter Module.** This allows the Performance 6000 to load its operational software from firmware installed within the server as well as being able to perform a Network Load. The Performance 6000 supports Self Load via a special adapter module. Installing a Self Load Adapter Module uses up a slot, thereby allowing a maximum of 80 ports installed. It also disables the PerformancePAK firmware on the main board, and the Power On Self Test and operational software load are performed from this Adapter Module.

The PerformancePAK resides on the main board for the Performance 6000 server, unless overridden by an optionally installed Self Load Adapter Module.

For a Performance 6000 server the port numbering starts at the leftmost bottom slot and proceeds up and towards the right when looking at the rear of the server. This enables additional modules to be installed in Performance 6000 servers (which have less than the full complement of adapter modules) as they are needed later, and prevents interference with currently installed cable configurations.

Each slot provides eight port numbers. For example, the first slot provides port numbers 1 through 8, the second slot provides port numbers 9 through 16, and so on up to the 11th slot which provide port numbers 81 through 88.

Only one dual parallel printer port adapter module is allowed in the Performance 6000 server and must be installed following the serial port adapter modules for the server to operate correctly. This reduces the number of serial ports which can be used in the server. For example, if the first ten slots of the Performance 6000 server contain serial port adapter modules (port numbers 1 through 80), and the parallel printer port adapter module is installed in slot 11, it uses port numbers 81 and 82 for each of the parallel ports. In this case port numbers 83 through 88 are unavailable.

The Ethernet adapter module must be installed in the 12th slot (upper rightmost if viewed from the rear of the server). If an optional Self Load adapter module is available, it must be installed in the 11th slot (exactly below the Ethernet adapter module). This leaves a maximum of 80 serial ports available, or a maximum of 72 serial ports and 2 parallel ports available.

1.4 Performance 8000:

The Performance 8000 hardware consists of the following:

- **Rack Mount Enclosure with LCD.** This chassis houses all of the components that make up the Performance 8000 subsystem, and includes the backplane, dual fans, and power supply. The built-in LCD display and front panel button allows the user to view/select information from any of the installed controllers.

- **Server Controller and Terminal Adapter Modules(s).** The Performance 8000 subsystem consists of from one to four server controllers and terminal adapter modules. These controller/adapter modules are each independent servers, which share a common LCD, power, ethernet interface and are hot-swappable. There are three types of server controller modules available.

  P8032 - This version of server controller provides RS-232 signal levels to support a 32 partial modem port configuration, or a 16 full modem port configuration. The modem configuration is determined by the server controller module's corresponding terminal adapter module jumper settings. Refer to the Performance 8000 hardware manual for proper settings.

  P8423 - This version of server controller provides RS-423 signal levels or is switch-selectable for RS-232 signal levels. In either case, only a 32 partial modem port configuration is supported.

P8422 - This version of server controller supports a 32 port RS-422 interface configuration only.

Any server controller type can be installed concurrently within the same Performance 8000 enclosure. **NOTE: Extreme care must be used when connecting the device cables for each of the different interface types within the same Performance 8000 subsystem, to prevent damage to the devices or server controllers.**

- **Multiport Transceiver and Ethernet Controllers.** The Performance 8000 subsystem consists of one multiport transceiver and one Ethernet controller, allowing all server controller modules access to the Ethernet network through a switch-selectable, 15 pin AUI connector or thinnet connector.

- **Redundancy Option.** The standard Performance 8000 has the capability to house one power supply, one multiport transceiver and one Ethernet controller. Ordering the redundancy option, offers the Performance 8000 a fully redundant dual power supply environment, and a redundant Ethernet configuration with two multiport transceivers and two Ethernet controllers. While the power supply modules and Ethernet controller modules are hot-swappable, the multiport transceiver modules are not.

Caution: The Performance 8000 provides the ability to swap certain components in the chassis without having to power the unit down. In all such cases and for your safety, only qualified service personnel are allowed to perform these operations.

The PerformancePAK resides on the main board of each Performance 8000 server controller. The available PerformancePak options are:

- **Network Load.** This allows each Performance 8000 server controller to load its operational software from any DECnet-compatible host, or TFTP host.

- **Self Load.** This allows each Performance 8000 to load its operational software from firmware installed within the server as well as being able to perform a Network Load.

2. PROBLEM REPORTING:

Please report any additional problems as well as suggestions for enhancement to:

Emulex Corporation
Attention: Technical Support Department
PO Box 6725
3535 Harbor Boulevard
Costa Mesa, CA. 92626
(714) 513-8270
(714) 513-8269 (FAX)
(714) 662-1445 (BBS)

In all cases be sure to include specifics of your environment:

* The version of the server software (which is displayed with the SHOW SERVER LOCAL command) and loader firmware revision (which is displayed with the SHOW SERVER HARDWARE command) you are using.

* How often the problem occurs and if it is repeatable.

* Any messages output to the console port (be sure you have a console port defined, and server options 5-6 enabled for messages).

* Your network configuration, including operating system revision(s).

Under certain circumstances you may be requested to send in a Crash Dump from the server, if possible. Obtaining a Crash Dump file is explained in chapter 8.2.

3. DOCUMENTATION ROADMAP:

The current documentation (and Model Numbers) for this Performance Series software version consists of the following components:

* The release notes you are now reading.

* Performance Series Server Hardware Installation Guide (HWI-XXXX)

  This guide outlines all the steps required for proper installation and configuration of the particular Performance Series Server you have.

* Performance Series UNIX Software Installation Guide (SWI-UNIX)

  This guide describes the procedure for installing and setting up the operational software for the server on a UNIX system.

* Performance Series VMS Software Installation Guide (SWI-VMS)

  This guide describes the procedure for installing and setting up the operational software for the server on a VMS system.

* Performance Series TCP/IP and LAT Protocol Manual (UG-TL)

  This manual contains all server commands, options, and features implemented in this software version.

* Performance Series Macro Utility User's Guide (UG-Macros)

  This guide describes using the Macro feature and provides information for developing Macros for the servers.

* Performance Series Kerberos User's Guide (UG-Kerberos)

  This guide describes using the optional Kerberos User-Authentication feature with the servers.

4. HOW TO USE THESE RELEASE NOTES:

The next few chapters describe this software release. Not all notes pertain to every model of server in the terminal server family. For example, any notes describing the parallel port do not apply to the Performance 8000; and the RCF (Remote Console Facility) port number is different for each Server based on the number of physical ports each server has available.

Some of the differences for the terminal server products are outlined below:

Feature:

Ser. Ports (Standard)	Ser. Ports (Expanded)	Console Port No.	Par. Port Number	RCF Port No.	Load File Name
Performance 2500: (P2504 or P2508, and P2516)					
4 or 8	None	1-4 or 1-8	9 or none	10	P2KTL0E
16 (2516)	None	1-16	None	17	P26TL0E
Performance 4000:					
16	16	1-32	33	34	P4KTL0E
Performance 6000:					
Increments of 8 ports		1-88	1-88	89	P6KTL0E

As a modular server, the number of serial port modules and positioning of a 2-port parallel module will determine your console port and parallel port numbering schemes. See Chapter 1.3 for a description on how to determine port numbering.

Performance 8000 (Model P8032/Full-Modem)					
16	None	1-16	None	33	P8KTL0E
Performance 8000 (Models P8423, P8422 & P8032/Non-Modem)					
32	None	1-32	None	33	P8KTL0E

5. INSTALLATION/UPGRADE PROCEDURE:

Please refer to the INSTALLATION CHECKLIST in the particular server model Hardware Installation Guide for a step-by-step outline of the upgrade/installation procedure.

Upgrading a Performance 4000 from either discrete TCP/IP or LAT software versions requires all permanent server/port characteristics to be re-initialized. You may be required to upgrade the PerformancePak firmware if the revision is less than 1.73. (Use the SHOW SERVER HARDWARE command for your server to display the PerformancePak firmware version.)

The format of the NVRAM (non-volatile memory) has been modified to accommodate the combined protocols. The first time the Performance 4000 software is loaded, the console port will inform the user a format mismatch exists between the NVRAM and the loaded software. The user will be prompted every minute to "**R**"eset NVRAM for new software or, "**A**"bort the load and halt the server. If after five minutes there has been no response, the server will automatically initialize NVRAM for the new software and reboot the server.

The software names for the Performance Series download files are:

Performance 2500	P2KTL0E
Performance 2500 (Model P2516)	P26TL0E
Performance 4000	P4KTL0E
Performance 6000	P6KTL0E
Performance 8000	P8KTL0E

The network load distribution media provides all of the above download files. A backup of the current download file should be performed before installing this version onto the host system.

6. DISTRIBUTION MEDIA:

The distribution media contains the operational load files for each server type. This enables users with many types of servers to install a software update all at once. For a Unix installation all load files are installed, and un-needed types may be deleted (to regain disk space). For VMS each server type is individually prompted for installation. The load file names and their associated server types are:

P2KTL0E	Performance 2500 Models P2504 and P2508
P26TL0E	Performance 2500 Model P2516
P4KTL0E	Performance 4000 all Models
P6KTL0E	Performance 6000 all Models
P8KTL0E	Performance 8000 all Models

The distribution media also contains several files and programs in addition to the operational load files. These additional files and programs can be categorized into six main functional areas: Loading, Configuration, Printing, Macro Feature, Network Management, and Common Usage. The areas, the file names and a brief description of their purpose are listed below:

6.1 Distribution Media Files:

There are two distribution kits: Unix and VMS. Each distribution kit is available in many popular media types (e.g. 9-track tape, 1/4" cartridge, 3 1/2" floppy, etc.) and is comprised of a number of files. These files are listed below along with which kit they belong to:

* Unix Loading (Unix distribution only)

bootpd.c	A bootp daemon which can be compiled for either System V or BSD based systems and can be started via the inetd process.
enstall	A Unix installation script to provide ease of installation, build host utilities, and configure servers for loading, printing and preparation for the Macro feature.

* VMS Configuration (VMS distribution only)

ESV_SETTINGS.COM	A command procedure for saving and restoring server EAROM configuration parameters on a VMS host. TSM-compatible program that takes the output of server LIST commands and creates the appropriate DEFINE commands to restore a server's configuration.
GENCFG.EXE	Executable program used by ESV_SETTINGS to save server configurations.
ESVCONFIG.COM	Program for configuring servers in the DECnet database and a local Emulex database. (DSVCONFIG compatible).
ESVCONFIG.DAT	Database file containing the configuration data from ESVCONFIG.COM.
PnnTL_xxx_DEFAULTS.COM	TSM Default files for the servers.

* Unix Configuration (Unix distribution only)

gencfg.c	A host resident program that takes the output of server LIST commands and creates the appropriate DEFINE commands to restore a server's configuration.
gencfg.scr	A sample script file to be used as input to telrcf to generate the input to gencfg.c.
host.c	Program to convert /etc/hosts data into SET NODE commands for the server.
srcfg	A menu-driven Unix script for saving and restoring server EAROM configuration parameters on a Unix host.
telrcf.c	A host resident program that can be used to access the Remote Console port of Emulex Corporation servers optionally taking commands from script files and sending the output to trace files.

* UNIX Printing (Unix distribution only)

lp_emlx1	Sample System V printer interface program.
printcap	Sample printcap file for System V based Unix hosts. BSD based hosts should have been provided with a printcap file.
rprint.c	Multi-queued BSD based or System V based host print filter source file.

* Network Management (VMS and Unix distribution)

emulex.mib	File which contains the ASN.1 descriptions of the proposed standard SNMP MIBs for Character-like, RS232-like, and Parallel-like devices.

* Macro Feature Files (VMS and Unix distribution)

macrod.c	A host resident program that listens and serves macro requests. (For VMS the file will be macrod.exe).
makemenu.c	A 'C' program Macro utility for creating macro menus. (For VMS the file will be makemenu.exe)

Used By makemenu.c for creating macro menus:

CMENU.TXT	These files can be used as an input file for MAKEMENU utility.
JONES.TXT	
SMITH.TXT	

Sample Executable Macros:

BOX.M	Used for drawing a box.
CMENU.M	A simple connect menu.
DEFAULTPORT.M	Used for setting the user default parameters for a port.
DEMO1.M	A Macro version of a server's DEMO command.
DIAMONDS.M	Used for drawing diamond patterns.
SECURE.M	A dual user Security macro.

Sub-Macros which are used by the Sample Executable Macros (not to be executed directly):

BOX_ANSI_SM.M	Used by BOX.M
BOX_TRY_SM.M	Used by BOX.M
BOX_VT_SM.M	Used by BOX.M
DIAMOND_SM.M	Used by DIAMONDS.M
JONES_SM.M	Used by SECURE.M
SMITH_SM.M	Used by SECURE.M

Additional Macro file examples:

SERVERNAME.L	An example of a login macro routing file.
STARTUPMAC.S	An example of a startup macro routing file.

* Unix Common Usage Files (Unix distribution only)

environ.h	Used by several utilities, which is the common header file and defines system dependent constants.
release.notes	Text file version of these release notes.
utilities.doc	Unix specific text file containing details of the above mentioned files and notes for using them on a Unix host.

7. SOFTWARE CHANGES / NEW FEATURES:

The next few paragraphs describe new features which were provided with this version of the Performance Series software. The features which are specific to either protocol (TCP/IP and LAT) are so noted.

Refer to chapter 4 for exceptions, and special considerations which may pertain to your particular server model.

7.1 Bootp and RARP Enhancements:

This feature is specific to the TCP/IP protocol.

Previous releases supported the following bootp parameters:

Server IP address
Server Subnet Mask
Server network load path name and file name
Host IP address

This release of an enhanced server bootp will accept and configure the following additional parameters from a TCP/IP bootp host:

Gateway IP address(es)
Time Server IP address(es)
Domain Name Serve IP address(es)
Server Node Name
Server Domain Name

Any other bootp parameters supplied by a bootp host will be ignored by the terminal server.

The command to support the enhanced bootp functionality on the server is:

DEFINE SERVER BOOTP n m [temp]

where "n" is the number of times to request bootp information if the server IP is not known (default is 2), "m" is the number of times to request bootp information if the server IP address is known (default is 1), and "temp" instructs the server to configure the acquired information in RAM only. If "temp" is omitted, the information will be written into NV RAM.

If no response is received after the "n" number of times to request bootp information, the server will issue a series of RARP requests. The RARP parameters may be configured using the following command:

DEFINE SERVER RARP n m [temp]

The parameter values are the same as described previously for BOOTP.

Use the command SHOW/LIST SERVER TCP to review the current settings for RARP and BOOTP under the "Configured Timers & Limits:", and "Broadcast:" headings in the center of the display.

7.2 Easy Installation Server Script:

This feature is specific to the TCP/IP protocol.

The enstall script has been modified in this software version to further enhace installation and configuration of all models of the Performance Series terminal servers. It provides descriptive, easy to follow steps of installing one or more servers using a host on the network from which the servers will be loaded from.

The script has been used with the following Unix operating systems, but is by no means limited for use on these systems. The script may be used with other Unix systems, but may require modifications to work correctly. Contact the address listed in chapter 2 if you are experiencing problems with this script.

*AT&T SYSTEM V Rel. 3.2, 4.0
BULL B.O.S UNIX Rel. 2.00
Data General DGux Rel. 5.4.1
Hewlett Packard HP-UX Rel. 8 & 9
*IBM AIX Rel. 1.0, 3.2.5
ICL SYSTEM V Rel. 4.0
INTERACTIVE UNIX Rel. 3.2
Motorola Sys V Rel. 3.2 (R32V3)
*SCO UNIX Rel. 3.2
*SOLARIS 1.1, 2.3
*SUN OS Rel. 4.0, 4.1, 4.1.1, 4.1.3
TADPOLE Rel. 3.2
Tandem Rel. A21 NonStop-UX
*ULTRIX Rel. 3.0, 4.0
Unisys SYSTEM V Rel 3.00, 3.2.0
*USL System V Rel 4.2

* The distribution media contains pre-compiled binaries for these system types, which precludes the necessit for compiling the distribution files referenced during usage of the enstall script.

7.3 Inactivity Logout Change:

The Inactivity Logout Full feature for a port has been changed slightly. In previous versions of terminal server software, the inactivity logout timer would not activate in order to eventually disconnect a remote connection if there was still buffered data to send to the port. This would cause the remote side of the connection to remain connected if the device connected to the port was in an XOFFed state indefinitely and buffered data could not be sent to the port.

The Inactivity Logout Full feature has been changed to activate even if there was buffered data. If the inactivity logout timer expires and logs out the port, the buffered data is lost.

7.4 Increased CSLIP Ports:

This feature is specific to the TCP/IP protocol.

The number of ports which can be configured for CSLIP has been increased to support 8 concurrent ports from 3 on the previous release. The allocation of the number ports is configured by defining the number of CSLIP compression table blocks to allow when the server initializes.

The following command defines the number of CSLIP table blocks to allocate when the server boots:

DEFINE SERVER CSLIP [LIMIT] n

where "n" is the number of blocks to reserve for each port which will use CSLIP. Use the command SHOW SERVER LIMITS to display the number of blocks currently reserved. If due to the number of other configurable server parameters (such as nodes, services, macro records, etc.) the required memory is not available for the CSLIP blocks, then the port connection will be downgraded to a standard SLIP connection (i.e. compression will not be performed on the port).

7.5 Keepalive Timer Enhancements:

This note is specific to the TCP/IP protocol.

The Keepalive timer option has been enhanced to allow TCP/IP connections to send keepalive packets whether the connection is initiated from the server, or into the server. Previous releases would not time out a TCP/IP connection if the server initiated the connection (master session) and would leave the port in a an apparent hung state.

The new command allows you to configure your server to select the ability send keepalive packets to verify connection failures for all server ports whether they are master (outgoing) or slave (incoming). The command is:

SET/ SERVER KEEPALIVE value [MASTER ENABLE|DISABLE] [SLAVE ENABLE|DISABLE]
DEFINE/
CHANGE

The value (10 to 180 seconds) is the interval for the keepalive packets. The Master and Slave connections are configured separately.

To view the current setting use the command SHOW SERVER TCP. The TCP Keepalive field under "Configured Timers & Limits" section of the screen will show one of the following displays depending on its current configuration:

TCP Keepalive (sec):	n	Enabled for Slave sessions - where n is the interval value specified (default is 20). This is the default.
TCP Keepalive (disabled):	n	Disabled for Master and slave sessions.
TCP Keepalive (master):	n	Enabled for Master sessions.
TCP Keepalive (m/s):	n	Enabled for both.

7.6 LAN Manager Support:

This note is specific to the TCP/IP protocol.

Support for Emulex terminal server products with Microsoft LAN Manager using the TCP/IP proocol is available on this release. This feature works with Microsoft OS/2 1.30 and higher and the Microsoft LAN Manager version 2.1 and higher. You need to have both Microsoft OS/2 and LAN Manager installed on a Fileserver (along with Microsoft LAN Manager's TCP/IP) in order to be able to use the Emulex Print Manager. You must also have a Product Authorization Key on the terminal server authorizing both TCP/IP and LAN Manager (LMT) products.

The Emulex Print Manager redirects the output of as many as sixteen Microsoft OS/2 printer queues to Emulex terminal servers installed on your network. This allows you to share your terminal servers beween LAN Manager clients as well as other systems using TCP/IP (Unix systems), and LAT (DEC systems).

For details on installing and using this product, refer to the Emulex LAN Manager/T User's Guide.

7.7 LAN Server Support:

This note is specific to the TCP/IP protocol.

Support for IBM's LAN Server is available for the Emulex terminal server family via TCP/IP and LPD on Ethernet networks. This support is available simultaneously with the other protocols supported on your particular terminal server.

It requires the TCP/IP protocol to be enabled (via a Product Authorization Key) and an LPD service to be created on the terminal server which will be supporting the LAN Server printing. Creating the LPD service is done with the command:

SET/DEFINE/CHANGE SERVICE LPD 515 PORT NONE TELNET DISABLED

Refer to the Emulex LAN Server Installation Procedures Addendum for details on installing, configuring, and using terminal servers in a LAN Server environment.

7.8 Ping -R Support:

This feature is specific to the TCP/IP protocol.

Many TCP/IP hosts support the -R option on their Ping command. The -R option inserts a Record Route option in the IP header in the ICMP Echo packet which is sent. The previous server releases would ignore and disable the option on a received ping when returning the packet to the sender. This release now accepts the option and adds the terminal server's primary IP address into the ping request if there is room, even if the ping was addressed to an alternate IP address on the server.

The server's Ping command does not support the -R option.

7.9 User-Defined Queue Names:

This feature is specific to the TCP/IP protocol.

Previous versions of software required the network or system administrator to define the remote printer name for LPD as TEXT or PASSTHRU depending on the need of trailing <CR>s, and if the LPD service was configured on the server.

User-defined queue (service) names can be defined in this release to allow users to set up their own remote queue names for LPD support. The TEXT and PASSTHRU queue names are still available for use if so desired.

In order to use this functionality, the LPD service on the server cannot have a physical port number assigned, and the new queue (service) name must have a TCP port number other than 515 assigned to it. Lower case service names are acceptable when enclosed within double quotes (").

Use the following command to remove any physical port assignments for the LPD service:

CHANGE SERVICE lpd PORT ALL DISABLE

The command CHANGE SERVICE "name1" 2510 PORT 14 TELNET DISABLE FILTER ENABLE configures a service called name1 for printing in text mode (inserts a <CR> with each <LF>) via TCP port 2510 and physical port 14. This will also be the remote printer queue name on the LPD client host. If no FILTER option is specified, ENABLE is the default.

The command CHANGE SERVICE "name2" 2511 PORT 15 TELNET DISABLE FILTER DISABLE configures a service called name2 for printing in passthru mode (no <CR>) via TCP port 2511 and physical port 15. This will also be the remote printer queue name on the LPD client host. If no FILTER option is specified, ENABLE is the default.

To display the current defined services on the server, use the command SHOW SERVICE LOCAL CHARACTERISTICS. An example is:

*Name: name1		Protocol(s):	TCP		
Connections:	enabled	Password:	disabled	Queue:	enabled
Telnet:	disabled	Filter:	enabled	TCP Port:	2510
ID:				Priority:	0
Server Port(s): 14					

8. ADDITIONAL PRODUCT NOTES:

Product Notes which are specific to either protocol (TCP/IP and LAT) are so noted.

Refer to chapter 4 for exceptions, and special considerations which may pertain to your particular server model.

8.1 CONNECT Favors Local Service:

This note is specific to the LAT protocol.

The CONNECT command will favor a local service over a remote service of the same name. For example, if you offer a service called PRINTER1 on the local server, and any number of remote servers also offer a service of the same name, a CONNECT command will always try to connect to the local service before attempting to connect to any remote service. This is done to minimize the amount of Ethernet traffic. This favoritism can be overridden by explicitly specifying the node on the CONNECT command.

8.2 Crash Dump:

Crash dump allows the server to upline-dump the contents of its memory to a file located on a DECnet or TCP/IP host.

The upline-dump feature is useful for gathering information from field sites for analysis by Emulex Corporation Technical Support. To enable the Crash Dump feature, the following conditions must exist:

1. The PerformancePak firmware must be revision 1.73 or greater. (1.80 or greater to support TCP/IP Crash Dump.)
2. Crash dump must be enabled on the server. Use SHOW SERVER to see if dump is enabled, and CHANGE SERVER DUMP ENABLE to enable it.
3. To perform a DECnet dump, at least one host must have the server node defined in the DECnet database with the ESVCONFIG command procedure, for the host to receive a Crash Dump request.
4. To perform a TCP/IP Crash Dump, a TCP/IP host must be defined in the server. Use a SHOW SERVER NETWORK screen display to view the TCP/IP Crash Dump host name, and IP address. If one does not exist, the server will default to a DECnet Crash Dump. If a TCP/IP Crash Dump is desired, use the command DEFINE SERVER PREFERRED DUMP NODE node_name IP d.d.d.d. To Crash Dump via a gateway use the command DEFINE SERVER PREFERRED DUMP NODE node_name IP d.d.d.d GATEWAY IP d.d.d.d. After specifying the TCP/IP node or TCP/IP gateway node to receive a Crash Dump request, the

file name on the host to contain the Crash Dump information must be configured. Use the command DEFINE SERVER DUMP FILENAME /file_name to specify the name of the file on the TCP/IP host to contain the Crash Dump. NOTE: The filename must exist on the TCP/IP host in order for the TCP/IP host to process the Crash Dump request properly. TFTP must also be available on the TCP/IP host.

5. A crash must occur. The crash can take place under any one of the following conditions:
    a. A privileged user issues the CRASH 300 command.
    b. A fatal server error occurs.

Please contact the address listed in chapter 2 if you are experiencing a problem. They will make the determination of whether you should obtain and send in a Crash Dump, and what information should accompany the Crash Dump.

For a DECnet Crash Dump, the files are stored on the host in MOM$LOAD: in a file name derived from "xxx" (Where xxx is the server family identifier, for example, "P2K" for Performance 2500, etc.) and the server name. For a TCP/IP Crash Dump, the files are stored on the host and file name specified at the server. The server command SHOW SERVER STATUS displays the name and address of the node last dumped to, so you can find the Crash Dump if you have the server defined on multiple hosts. The values displayed for the node name and ethernet address come from the host settings in the DECnet database for a DECnet Crash Dump.

For a subsequent dump attempt the host last dumped to successfully will be the default host for the next Crash Dump. If the host is not available or the dump fails for some reason, the server will send out a multicast dump request and will dump to the first host responding to the request. Only hosts with the server defined in the host's DECnet database for a DECnet Crash Dump, will respond.

8.3 Dedicated Port Connections Echo a Bell:

Typing a <CR> on a port which is set up as a dedicated port to a particular service will echo the <CR> with a bell character to alert the user a connection attempt is being made. The bell character is output in lieu of the connection messages printed on non-dedicated ports. The character only becomes a concern where it may affect other communications hardware directly connected to the server port.

8.4 DELETE NODE Command With Well-Known Nodes:

Deleting node names containing any part of the well-known node names (GATEWAY, NETSERVER, TIMESERVER) must be followed with a "." (period) or the entry for the well-known node name will get deleted instead. For example, "DELETE NODE TIM" will delete the TIMESERVER entry if one is present, while "DELETE NODE TIM." will delete a node named "TIM".

8.5 Network Management - emulex.mib:

This note is specific to the TCP/IP protocol.

The emulex.mib file contains the ASN.1 descriptions of the proposed SNMP MIB standards for Character, RS-232 and Parallel-like devices. The following items are exceptions from the proposed standard as used by the server.

charPortLastChange -	Does not return the elapsed time for the state of the port; instead it returns the elapsed time since the server was initialized.
charSessKill -	Not supported.
charSessInCharacters -	Not supported.
charSessOutCharacters -	Not supported.
charSessStartTime -	Implemented for TCP/IP connections, but is not available for LAT connections at this time.
paraInSigState -	Not accurately reported because the server monitors signals as a group, not individually.
paraInSigChanges -	Not supported.
rs232InSigChanges -	Not supported.
rs232OutSigChanges -	Not supported.

The following variable which is defined as read/write in the MIB, is read-only in the server:

charPortAdminStatus	Set to "enabled"; cannot set to "disabled", "off", or "maintenance".

8.6 Saving Server Configurations:

A set of programs are included on the release tape which allow server configurations to be saved and restored onto a host system using either the LAT or TCP/IP protocol. The TSM (DEC "Terminal Server Manager") program is required on the host to save server configurations using the LAT protocol.

NOTE: References to file names in this chapter is done using a mask. For example for the "xxx..." file name, the "xxx" refers to a family of servers. For example, the actual file name for the Performance 4000 is "P4K...".

8.6.1 Saving Configurations - LAT:

A command file is used to save and restore the server settings, using the DEC utility TSM to log in to a server and display various information screens, then using the executable image, gencfg.exe, to analyze those screens. To start the command file, use the DCL command:

@MOM$LOAD:ESV_SETTINGS

You will be asked whether you want to SAVE or RESTORE server settings, what the name of the server is, and (for SAVE) whether to use SHOW or LIST to display the current or stored settings. The SAVE option will create a command file named MOM$LOAD:xxx_servername_SETTINGS.COM (where xxx represents the server type) and contains all of the non-default server, port, and service parameters. The RESTORE option will set the server to the default settings by executing xxx_024_DEFAULTS.COM (where xxx represents the server type and 024 represents the 2.4 software version), then set up all of the specific server information from the saved settings file.

To use ESV_SETTINGS, you must have installed ESV_SETTINGS.COM and gencfg.exe from the distribution medium. You must have TSM installed, and you must have the specified server in the TSM database of servers. Also, TSM will be making an RCF connection to the server, so there can be no other RCF activity on the server. There are a few parameters ESV_SETTINGS cannot save for a server; the command file indicates what these parameters are after doing a SAVE or RESTORE. ESV_SETTINGS can be run as a batch file with parameters P1-P3 passed to it.

8.6.2 Saving Configurations - TCP/IP:

Refer to the utilities.doc file provided on the TFTP load tape, for instructions on how to use the save and restore server configuration utility on a Unix system.

8.7 SET PORT AUTOBAUD ENABLE:

Using the command SET PORT n AUTOBAUD ENABLE requires the terminal attached to the port to be set for 8-bit no-parity, or 7-bit even-parity for autobaud to work correctly. The AUTOBAUD option should always be disabled for service ports.

8.8 SET/DEFINE/CHANGE PORT ALL:

For servers with parallel printer ports, the command SET/DEFINE/CHANGE PORT ALL is NOT recognized for parallel ports. Therefore, to change all authorized group codes to minimize internal table usage, you must explicitly state the complete port range:

CHANGE PORT n AUTHORIZED GROUP xxx

where n is the parallel port number(s) for the server and xxx is the group list.

8.9 Swapping Performance 8000 Controllers Between Slots:

Caution must be exercised when swapping Performance 8000 server controller boards from one slot to another. This caution is regarding the possibility for multiple controllers to be configured with the same server name.

The server name for every server on the network must be unique. The factory default name for the Performance 8000 is "'P8K'+Ethernet address", for example P8K0000C9000000. Since the Ethernet address is located on the backplane, multiple boards which were factory defaulted in the same slot will have the same server name. This can cause subtle network difficulties, and as such:

EMULEX CORPORATION STRONGLY RECOMMENDS ENSURING THE SERVER NAME FOR EACH CONTROLLER IS UNIQUE, AND NOT THE FACTORY DEFAULT, ESPECIALLY WHEN SWAPPING CONTROLLERS FROM SLOT TO SLOT.

The server name can be changed by using the DEFINE/CHANGE SERVER NAME command.

SPECIAL NOTE: In order to use this feature on the Performance 8000, the left front panel and metal shield must be removed to access the server controllers. This MUST be performed by qualified service personnel.

8.10 TCP/IP Software Installation Notes:

This note is specific to the TCP/IP protocol.

The files on the distribution tape enables the user to have the distribution files installed on the host in a subdirectory named "emlx" under the current working directory of the user installing the files. For example, if a user's current working directory is /user/operator, then the distribution files would be installed in the directory /user[B/operator/emlx.

8.11 ULTRIX (LAT) Support:

These next few sections contain information on using the servers under the Ultrix-32 operating system. More complete information on using servers under Ultrix can be found in the DEC Ultrix documentation.

8.11.1 Making an ULTRIX System a Server Load Host:

If you intend your host system to be a load host add the following entries to the system's configuration file if they are not already present:

```
options   DLI
pseudo-device   dli
```

The configuration file can be found in the directory /sys/conf and has the name of your system, for example, if your system name is ROYAL then your configuration file will be in /sys/conf/ROYAL. You must rebuild the kernel to make sure the changes take effect. You can use the /etc/doconfig utility to assist you in this.

Next, edit the /etc/rc.local file which allows you to start the network interface and the mop_mom daemon on system boot-up. To start the network interface use one of the line entry examples listed below, depending on your configuration:

Line Entry:	Network Interface Type:
/etc/ifconfig de0 '/bin/hostname'	(Unibus DEUNA, DELUA)
/etc/ifconfig qe0 '/bin/hostname'	(Q-Bus DEQNA, DELQA)
/etc/ifconfig se0 '/bin/hostname'	(Micro-VAX 2000 DESVA)
/etc/ifconfig ni0 '/bin/hostname'	(BI DEBNT, DEBNA)

To start the mop_mom daemon (these commands must come after the command to start the network interface):

```
if [ -f /etc/mop_mom ]; then
   /usr/etc/mop_mom &
fi
```

The command above will cause your host to load all servers that it has the requested software for, and to accept dumps from all servers requesting to do so. If this is not desired for your node, you may alternatively use the command below to cause the mop_mom daemon to search the nodes database and support only servers that it finds there. Use the Emulex utility ESVCONFIG to manage this database.

```
if [ -f /etc/mop_mom ]; then
    LOADDUMP_SECURE=on /usr/etc/mop_mom &
fi
```

You now must install the server software image on your host. To do this mount the media on your host and make sure it is write protected. From a terminal type the following syntax. Replacing the '?' symbol with your system's device number.

```
setld -l /dev/rmt?h
```

From here the setld utility will prompt you on completing the installation.

To make your changes effective you must now reboot your system. Type the following command to shut down the system and reboot.

```
/etc/shutdown -r "Rebooting For Server Support"
```

You may use any of the three ways of downloading a server to load software. The first and simplest method is to connect the server to the network and power it up. The server will automatically request its software from your host. Remember that if you used the LOADDUMP_SECURE options that this node must be in your database or the request will be ignored.

Secondly, you may use the load command from the host to load the server. Again the server must be in the node database; use the ESVCONFIG utility provided to manage this database. The syntax is:

```
/etc/load willie -p [nnnnn...]
```

Where willie is the name of the server and 'nnnnn' is the service password.

Thirdly you may use the trigger command. The difference between load and trigger is that load will force the server to accept the software defined in the nodes database whereas trigger will allow the server to request the software name defined in its own local database. Currently, the server does not support directed software loading so there is no effective difference between trigger and load. The syntax for trigger is:

```
/etc/trigger willie -p [nnnnn...]
```

Where willie is the name of the server and 'nnnnn' is the service password.

Type the following command to confirm the download was successful:

```
more /usr/spool/mqueue/syslog
```

If the load was successful you should see entries similar to the following:

```
Jun 13 12:22:17 localhost: 2459 mop_dumpload: sending volunteer assistance for system
load, (target node Ethernet address = 00-00-c9-00-29-8B Jun 13 12:22:18 localhost: 2459
mop_dumpload: sending system image, (target node Ethernet address = 00-00-c9-00-29-
8B)
```

8.11.2 Supporting Printers From an ULTRIX Host:

First you must match printer and server hardware settings and determine your printer's characteristics. Make a list of the printer's character size, flow control method, parity and speed. Execute the following server command:

Server> SHOW PORT n HARDWARE

Where n is the number of the port you wish to connect your printer to. Then if necessary, change the port characteristics using server commands similar to:

Server> CHANGE PORT n ACCESS REMOTE
Server> CHANGE PORT n SPEED 9600
Server> CHANGE PORT n AUTOBAUD DISABLE

For further information on setting port configurations see the server manual.

After you connect the printer to the port you have just configured on the server, execute the following command to test the port on the server:

Server> TEST PORT n COUNT 59

You should see a full page of slewed character patterns being output to your printer. If you do not get the test pattern, check your printer, the port characteristics, or the cable.

If you have not already done so you must now select a name (service) for your server and server printer port. The current settings for these items can be viewed with the following server commands:

Server> SHOW SERVER NET
Server> SHOW PORT n LOCAL

The settings can be changed with server commands similar to the ones shown below:

Server> CHANGE SERVER NAME ROYAL
Server> CHANGE PORT n NAME PRINTER_1

To have successful printer connections you must prevent others from accidently logging into the port you will be using for printing on your host. To disable logins, edit the file /etc/rc.local and select the LAT terminal device (they are identified by a major device number of 39). Place the following command in the file after the local daemons section:

```
if [ -f /etc/lcp ]; then
    /etc/lcp -s -h /dev/tty12 >/dev/console
fi
```

To have this command take effect without rebooting your system, execute the following command:

```
/etc/lcp -s -h /dev/tty12
```

Next you must change the entry for the LAT terminal line in the /etc/ttys file. An entry for the line you have selected should look like the following:

```
tty12 "/etc/getty T9600" vt100 off nomodem # LAT Printer
```

To make this change take effect immediately type the following.

```
kill -HUP 1
```

Now you must make an entry for your printer in the /etc/printcap file. A sample entry is shown below.

```
lp1|la05|Terminal Server Printer:\
        :fs#023:\
        :fc#0177777:\
        :lp=/dev/tty12:\                    (LAT terminal line)
        :ts=ROYAL:\                         (Server name)
        :os=LAZER:\                         (Service name)
        :op=PORT_33:\                       (Server port number)
        :lf=/usr/adm/lpd-errs:\
        :if=/usr/lib/lpdfilters/lpf:\
        :af=/usr/adm/lp1acct:\
        :sd=/usr/spool/lp1:
```

The entries os and po may be used together or may be used separately, but one of them must always be present. For information on other entries in this example consult your DEC ULTRIX documentation.

You must now set up the spool directory that you just defined in the /etc/printcap file. As per the example above, you would type:

```
cd /usr/spool mkdir lp1 chown daemon lp1
```

You are now ready to print files from your ULTRIX system to the printer connected to the server using the following syntax on the system:

```
lpr -Plp1 <file name here>
```

8.11.3 Host-Initiated Connections (HIC):

To define the connection between the host and the server (for example, in an application program), type the following command:

```
lcp -h /dev/tty<nn>:<server name>:<port name>
```

Where <nn> is the number of the tty you have selected, <server name> is the name of your target server and <port name> is the name of the target server port. For example:

```
lcp -h /dev/tty12:ROYAL:PORT_16
```

Use the kill command to make this change effective immediately.

```
kill -HUP 1
```

Also you need to change the /etc/ttys file to prevent others from logging in on your system's LAT terminal line. The entry for the tty should look like this:

```
tty12 "/etc/getty T9600" vt100 off nomodem # HIC Port
```

For further information on HIC connections consult your DEC ULTRIX documentation.

9. PRODUCT PROBLEMS WHICH HAVE BEEN RESOLVED:

Listed below are descriptions of problems which have been resolved in this release. For some problems, additional comments describe changes made in several areas in order to resolve the problem. The resolved problems which are specific to either protocol (TCP/IP and LAT) are so noted.

9.1 CHANGE SLIP PORT ALL Gets Error 719:

This note is specific to the TCP/IP protocol.

SLIP entries configured using the CHANGE SLIP PORT ALL ... caused a Server Error 719 - Insufficient Resources. This problem has been corrected.

9.2 Dedicated TCP Ports Won't Disconnect:

This note is specific to the TCP/IP protocol.

If a local port was configured as Dedicated, Autoconnect and Access Remote, and used with TCP/IP, and the remote side is logged out, the port would not time out, and would not re-establish the connection automatically. The remote side would then remain idle. You must use the new Keepalive Timer Enhancement described in section 7.5 to allow the local connection (master) to recognize the remote side (slave) has disconnected.

9.3 No RIP Announcements on Inactive SLIP Line:

This note is specific to the TCP/IP protocol.

If Routing was enabled on the server (using the command SET/DEFINE/CHANGE ROUTE RIP ENABLED), and the -R flag was used for the Route table entries (SET/DEFINE/CHANGE ROUTE IP d.d.d.d -r), RIP announcements no longer occurred for new SLIP connections, if at one time, all ports which were configured to allow SLIP were inactive at the same time. This problem has been corrected.

9.4 Ports Hung in Transition State:

This note is specific to the LAT protocol.

A problem was corrected whereby LAT HIC ports could get hung in a transition state after each print job. This was associated with 3038 alarms being logged which are displayed using the command SHOW SERVER ALARMS.

9.5 Server Crash With Code 6102:

The server would crash unexpectedly with a 6102 alarm code. This problem has been corrected.

9.6 Slow Response on Port 37:

There was a bug in the buffer handling on a Performance 6000 and was causing port 37 to experience slow performance. This problem has been corrected.

9.7 XOFF'd Port Does Not Logout:

If Inactivity Logout Full is enabled for a port, and the port is in an XOFF state, the port does not log out. This was caused by the buffered data remaining for the port being treated as "active". This release will now unconditionally logs out the port if no activity has occurred within the configured inactivity timer value and INACTIVITY LOGOUT is set to FULL. Refer to the Inactivity Logout Change in section 7.3

10. KNOWN PROBLEMS WITH THIS RELEASE:

This chapter lists known outstanding bugs with this software release. Many of these errors are cosmetic in nature and have convenient workarounds. The problems which are specific to either protocol (TCP/IP and LAT) are so noted.

10.1 Baud Rate Problem With PPP:

This note is specific to the TCP/IP protocol.

Using PPP with Frontier's SuperTCP at greater than 9600 baud is not reliable. If communicating with Frontier's SuperTCP you must use 9600 baud or lower.

10.2 SHOW SERVER STATUS COUNTERS:

The counters displayed on the SHOW SERVER STATUS for PORTS and USERS can display inaccurate information. These counters display the current number of server ports in use or interactive server users respectively. Under certain circumstances the counters may not be decremented properly, yielding an incorrect count.